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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,589	03/07/2002	Vijayen S. Veerasamy	3691-376	7654

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EXAMINER
ROSSI, JESSICA

ART UNIT	PAPER NUMBER
1733	

DATE MAILED: 08/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/091,589	Applicant(s) VEERASAMY, VIJAYEN S.	
	Examiner Jessica L. Rossi	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6/25/03, Election* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) *19-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 36-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4,7* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

Species A (appears to be claims 1-18 and 36-46), drawn to tempering and an IG window (see Figure 1).

Species B (appears to be claims 19-35 and 36-46), drawn to bending and a vehicle window (see Figure 2).

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, **claim 36 is generic**.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to

be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. During a telephone conversation with Mr. Rhoa on 8/4/03 a provisional election was made without traverse to prosecute the invention of Species A, claims 1-18 and 36-46. Affirmation of this election must be made by applicant in replying to this Office action. Claims 19-35 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 36-37, 39, 41, 45, 1-2, 6-7, and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Veerasamy (WO 00/66506; provided in IDS) in view of the Admitted Prior Art in the specification of the present application, or alternatively, the Admitted Prior Art in view of Veerasamy.

**It is noted that "on the glass substrate" does mean that the layer must be in direct contact with the glass substrate. If fact, the present specification specifically states that this phrase is not limited to being in direct contact with the substrate (p. 7, [0026]).*

With respect to claim 36, Veerasamy is directed to making coated glass articles, such as IG windows (abstract; p. 37, line 13). The reference teaches providing a glass substrate 1,

forming a DLC layer 3 (consisting of DLC layers 7, 8) on the glass substrate, forming a protective layer 12 on the DLC layer, and heat treating the coated glass substrate wherein the protective layer prevents the DLC layer from burning off during the heating step (Figure 8; p. 12, lines 1-15; p. 37, lines 16-20). The reference teaches heating to a "high" temperature in an oxygen environment but is silent as to the temperature being at least 580°C and the heating period being sufficient for thermal tempering.

It appears Applicants are teaching it is known in the art to coat a glass article, to be used in an IG window, and then heat the coated article to a temperature of at least 600°C in an oxygen environment for a period of time that enables thermal tempering of the same (p. 1, [003]). It would have been obvious to the skilled artisan at the time the invention was made to have the "high" temperature of Veerasamy be at least 580°C such that thermal tempering is possible because heating a coated glass article to such high temperatures sufficient for thermal tempering is known in the art, as taught by the Admitted Prior Art, and thermal tempering imparts a variety of desirable characteristics to the glass.

Alternatively, it would have been obvious to the skilled artisan at the time the invention was made to provide the glass substrate of the Admitted Prior Art with a DLC layer and protective layer on top of the DLC layer prior to heating because such is known in the art, as taught by Veerasamy, wherein the DLC layer protects the glass from corrosion and/or staining (Veerasamy; p. 3, lines 13-21) while the protective layer prevents the DLC layer from burning-off during the heating step (Veerasamy; p. 37, lines 16-20).

With respect to claims 1 and 39, all the limitations were addressed above with respect to claim 36, except coupling the heat-treated coated glass substrate to another substrate to make an

IG window. Veerasamy teaches using the heat-treated coated glass substrate in an IG window (p. 37, lines 11-15), wherein the skilled artisan would have readily appreciated that an IG window requires a glass substrate to be coupled to one or more other glass substrates, especially in light of the teachings of the Admitted Prior Art (p. 1, [0003]).

Regarding claims 37 and 2, Veerasamy teaches forming the DLC layer via ion beam deposition wherein the carbon atoms are subimplanted into the glass (p. 16, lines 10-12).

Regarding claim 41,Veerasamy is silent as to removing at least part of the protective layer after heat-treating. It is notoriously well known and conventional to use protective layers, or sacrificial layers, to protect underlying layers during particular processing steps that would likely damage those layers. It is also notoriously well known and conventional to remove the protective layer after the processing step if it no longer serves a purpose. Therefore, it would have been obvious to the skilled artisan at the time the invention was made to remove at least part of the protective layer of Veerasamy after heat treating because one reading the reference as a whole would have appreciated that its only purpose is to protect the underlying DLC layers and therefore contributes nothing to the final properties of the coated glass.

Regarding claim 6, all the limitations were addressed with respect to claim 41, except removing the protective layer before coupling the coated substrate to another substrate. Removing it before or after coupling would have been within purview of the skilled artisan at the time the invention was made depending on what side of the glass substrate the protective layer is on.

Regarding claim 7, this limitation was addressed above with respect to claim 36.

Regarding claims 12-13, these limitations were addressed above with respect to claim 36.

Regarding claims 45 and 14, Veerasamy teaches the DLC layer comprising amorphous DLC and having more sp3 carbon-carbon bonds than sp2 carbon-carbon bonds (p. 8, lines 5-6).

5. Claims 38 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Veerasamy and the Admitted Prior Art, or alternatively the Admitted Prior Art and Veerasamy, as applied to claims 36 and 1 above, and further in view of Kimock et al. (US 5635245; provided in IDS).

Regarding claims 38 and 3, Veerasamy is silent as to forming the DLC layer by sputtering. It would have been obvious to use sputtering as an alternative deposition technique to an ion beam because such is known in the art for depositing DLC onto a glass substrate, as taught by Kimock (column 11, lines 15-27), wherein only the expected results would have been achieved.

6. Claims 40 and 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Veerasamy and the Admitted Prior Art, or alternatively the Admitted Prior Art and Veerasamy, as applied to claims 36 and 1 above, and further in view of Hartig et al. (US 5514476; provided in IDS).

Regarding claims 40 and 4-5, Veerasamy is silent as to a solar control coating on the side of the glass opposite the DLC layer. It is known in the art to provide a solar control coating on the interior surface of a glass substrate used in an IG window, as taught by the Admitted Prior Art (p. 1, [003]). It is also known in the art to have that solar control layer comprise dielectric layers and Ag and NiCr layers sandwiched between the dielectric layers, as taught by Hartig (Figures 1-2).

It would have been obvious to the skilled artisan at the time the invention was made to provide a solar control coating on the surface of the glass substrate of Veerasamy opposite the DLC layer because such is known in the art, as taught by the Admitted Prior Art, wherein the solar control coating improves the performance of the IG window.

7. Claims 42-44 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Veerasamy and the Admitted Prior Art, or alternatively the Admitted Prior Art and Veerasamy, as applied to claims 36 and 1 above, and further in view of the collective teachings of Ebisawa et al. (US 6451434) and Lingle et al. (US 5688585; provided in IDS).

Regarding claims 42-43 and 8-10, Veerasamy is silent as to the protective layer being these materials. However, the reference does teach the protective layer can be **any suitable material** for preventing burn-off of the DLC layer during heating (p. 38, lines 1-2). The reference also teaches that the DLC layer can be sandwiched between the protective layer and a silicon oxide or silicon nitride layer 5 (Figure 3; p. 14, lines 1-18).

The prior art has recognized the need to protect coated glass substrates during high temperature heat-treating steps, which enable tempering, bending, etc. of the coated glass, in order to prevent degradation of the coating. The prior art accomplishes this goal by sandwiching the coating layers between a variety of protective layers having high-temperature resistance such as oxides, nitrides, and carbides of silicon, titanium, etc., as taught by the collective teachings of Ebisawa (column 3, lines 23-26 and 32-36 and 43-45; column 4, lines 25-26; column 5, lines 62-67; column 8, lines 50-66; column 9, lines 1-2) and Lingle (column 1, lines 40-65; column 5, lines 28-32; column 11, lines 8-14).

Selection of a particular material for the protective layer of Veerasamy would have been within purview of the skilled artisan. However, one reading the reference as a whole would have appreciated that the particular type of protective layer is not critical to the invention, provided it can perform the necessary function of preventing burn-off of the DLC layer, and therefore it would have been obvious to use the materials taught by the collective teachings for the protective layer of Veerasamy because their high-temperature resistance would only produce the expected results of preventing burn-off the DLC layer.

Regarding claims 44 and 11, selection of particular amounts of each component present in the compounds would have been within purview of the skilled artisan at the time the invention was made.

8. Claims 46 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Veerasamy and the Admitted Prior Art, or alternatively the Admitted Prior Art and Veerasamy, as applied to claims 36 and 14 above, and further in view of Veerasamy et al. (US 6277480).

Regarding claims 46 and 15-16, Veerasamy is silent as to the DLC layer's hardness. Selection of a particular hardness would have been within purview of the skilled artisan at the time the invention was made. However, it would have been obvious to use a DLC layer having a hardness consistent with that claimed in the present invention because such is known in the art, as taught by Veerasamy '480 (column 10, lines 9-26).

9. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Veerasamy and the Admitted Prior Art, or alternatively the Admitted Prior Art and Veerasamy, as applied to claim 1 above, and further in view of Yamasaki et al. (EP 0723944).

Regarding claim 17, Veerasamy teaches the DLC layer having a density of at least 2.7 g/cm3 (p. 9, lines 1-2) but is silent as to it being hydrogenated. Selection of a particular type of DLC layer would have been within purview of the skilled artisan. However, it would have been obvious to use a hydrogenated DLC because such is known in the art, as taught by Yamasaki et al. (p. 3, lines 39-40).

Regarding claim 18, all the limitations were addressed with respect to claim 17 above except the DLC being highly tetrahedral amorphous carbon. Veerasamy teaches this (p. 12, lines 2-3).

10. Claims 36-37, 39, 43, 45-46, 1-2, 7, 10, and 12-16 are rejected under 35 U.S.C. 103(a) as being obvious over Veerasamy et al. '480 in view of Veerasamy '506 and the Admitted Prior Art.

With respect to claim 36, Veerasamy '480 is directed to making coated glass articles, such as IG windows (column 13, lines 20-26). The reference teaches providing a glass substrate 1, forming a layer 2 on the glass substrate, forming a DLC layer 3 on layer 2, and forming a layer 4 on the DLC layer (Figure 1a; column 4, lines 60 and 66; column 7, lines 64-67). The reference teaches layer 4 being a variety of materials such as silicon oxide or titanium oxide (column 7, lines 64-66). It is noted that the present invention also teaches the protective layer being these same materials (p. 9, [0031]); therefore, the skilled artisan would have appreciated that layer 4 of Veerasamy '480 would also serve as a protective layer for preventing burn-off of the DLC during heating at high temperatures that enable thermal tempering of the glass. However, Veerasamy '480 is silent as to heating the coated glass substrate to at least 580°C for a period sufficient to enable tempering of the glass.

It is known in the art to heat a coated glass substrate having multiple coating layers thereon, wherein a DLC layer is sandwiched between two layers (DLC layer 3 can be between layer 5 and layer 12), to high temperatures for subsequent processing steps, as taught by Veerasamy '506 (see paragraph 4 above for a complete discussion of the reference). It is also known in the art to heat a coated glass substrate to high temperatures of at least 600° for a period time sufficient for thermal tempering of the glass, as taught by the Admitted Prior Art (see paragraph 4 above).

It would have been obvious to the skilled artisan at the time the invention was made to heat the coated glass substrate of Veerasamy '480 to at least 580°C for a time period sufficient for thermal tempering of the glass because such is known in the art, as taught by Veerasamy '506 and the Admitted Prior Art, wherein thermal tempering will impart desirable characteristics to the glass.

Regarding claims 39 and 1, all the limitations were addressed above with respect to claim 36, except coupling the heat-treated coated glass substrate to another substrate to make an IG window. Veerasamy '480 teaches these limitations (column 13, lines 20-26).

Regarding claims 37 and 2, Veerasamy '480 teaches forming the DLC layer via ion beam deposition (column 7, lines 1-2). It would have been obvious to have the carbon atoms subimplanted into the glass because such is known in the art, as taught by Veerasamy '506 (p. 16, lines 10-12).

Regarding claims 43 and 10, Veerasamy '480 teaches the protective layer 4 being silicon oxide or titanium oxide (column 7, lines 64-66).

Regarding claims 45 and 14, Veerasamy '480 is silent as to this limitation. It would have been obvious to use a DLC layer having more sp3 than sp2 carbon-carbon bonds because such is known in the art, as taught by Veerasamy '506 (see paragraph 4 above).

Regarding claims 46 and 15-16, Veerasamy '480 teaches the DLC layer having a hardness consistent with that claimed in the present invention (column 10, lines 9-26).

Regarding claim 7, all the limitations were addressed with respect to claim 36.

Regarding claims 12-13, all the limitations were addressed with respect to claim 36.

11. Claims 38 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Veerasamy '480, Veerasamy '506, and the Admitted Prior Art as applied to claims 36 and 1 above, and further in view of Kimock et al.

Regarding claims 38 and 3, Veerasamy '480 is silent as to forming the DLC layer by sputtering. It would have been obvious to use sputtering as an alternative deposition technique to an ion beam because such is known in the art for depositing DLC onto a glass substrate, as taught by Kimock (column 11, lines 15-27), wherein only the expected results would have been achieved.

12. Claims 40 and 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Veerasamy '480, Veerasamy '506, and the Admitted Prior Art as applied to claims 36 and 1 above, and further in view of the Admitted Prior Art and Hartig et al.

Regarding claims 40 and 4-5, Veerasamy '480 is silent as to a solar control coating on the side of the glass opposite the DLC layer. It is known in the art to provide a solar control coating on the interior surface of a glass substrate used in an IG window, as taught by the Admitted Prior Art (p. 1, [003]). It is also known in the art to have that solar control layer comprise dielectric

layers and Ag and NiCr layers sandwiched between the dielectric layers, as taught by Hartig (Figures 1-2).

It would have been obvious to the skilled artisan at the time the invention was made to provide a solar control coating on the surface of the glass substrate of Veerasamy '480 opposite the DLC layer because such is known in the art, as taught by the Admitted Prior Art, wherein the solar control coating improves the performance of the IG window.

13. Claims 42, 44, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Veerasamy '480, Veerasamy '506, and the Admitted Prior Art as applied to claims 36 and 1 above, and further in view of Ebisawa et al.

Regarding claims 42 and 9, Veerasamy '480 is silent as to the protective layer comprising carbide. Applicants are directed to paragraph 7 above for a complete discussion of Ebisawa. It would have been obvious to use a carbide layer as an alternative to the oxide layer of Veerasamy '480 because such is known in the art, as taught by Ebisawa, wherein only expected results of protecting the DLC layer would have been achieved.

Regarding claims 44 and 11, selection of particular amounts of each component present in the compounds would have been within purview of the skilled artisan at the time the invention was made.

14. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Veerasamy '480, Veerasamy '506, and the Admitted Prior Art as applied to claim 1 above, and further in view of Yamasaki et al.

Regarding claim 17, Veerasamy '480 is silent as to these limitations. Selection of a DLC layer having particular properties would have been within purview of the skilled artisan.

However, it would have been obvious to use a DLC layer having a density of at least 2.7 g/cm3 because such is known in the art, as taught by Veerasamy '506 (p. 9, lines 1-2). It also would have been obvious to use a hydrogenated DLC because such is known in the art, as taught by Yamasaki et al. (p. 3, lines 39-40).

Regarding claim 18, all the limitations were addressed with respect to claim 17. In addition, Veerasamy '480 teaches the DLC being highly tetrahedral amorphous carbon (column 6, lines 59-60).

15. Claims 36-39, 42-44, 45, 1-3, 7, 9-11, 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimock et al. in view of the Admitted Prior Art and Veerasamy '506.

With respect to claim 36, Veerasamy is directed to making coated glass articles, such as architectural windows (abstract). The reference teaches providing a glass substrate 1, forming a DLC layer 3 on the glass substrate, and forming a layer 4 on the DLC layer (Figure 3; column 1, lines 38-41; column 5, line 30; column 7, line 53 – column 8, line 1). The reference teaches layer 4 being a variety of materials such as silicon nitride, silicon oxide, titanium oxide, silicon carbide, etc. (column 7, line 53 – column 8, line 1). It is noted that the present invention also teaches the protective layer being these same materials (p. 9, [0031]); therefore, the skilled artisan would have appreciated that the layer 4 of Kimock would also serve as a protective layer for preventing burn-off of the DLC during heating at high temperatures that enable thermal tempering of the glass. However, Kimock is silent as to heating the coated glass substrate to at least 580°C for a period sufficient to enable tempering of the glass.

It would have been obvious to heat the coated glass substrate of Kimock to at least 580°C for a time period sufficient to enable thermal tempering because it is known in the art to do this

to coated glass, as taught by the Admitted Prior Art, and especially coated glass having a DLC layer thereon and which is to be used in architectural windows, as taught by Veerasamy '506 (see paragraph 4 above for complete discussion of these references), wherein tempering will impart desirable characteristics to the glass.

With respect to claim 1 and 39, Kimock teaches the glass being used in an architectural window wherein the skilled artisan would have readily appreciated that such encompasses IG windows. Furthermore, the Admitted Prior Art and Veerasamy teach thermal tempering coated glass to be used in IG windows (see paragraph 4 above).

Regarding claims 37-38 and 2-3, Kimock teaches ion beam depositing or sputtering the DLC layer onto the glass substrate (column 11, lines 15-26).

Regarding claim 7, all the limitations were addressed above with respect to claim 36.

Regarding claims 9-10 and 42-43, Kimock teaches the protective layer 4 being silicon carbide, silicon oxide, titanium oxide, etc. (column 7, lines 62-67).

Regarding claims 45 and 14, Kimock is silent as to this limitation. It would have been obvious to use a DLC layer having more sp3 than sp2 carbon-carbon bonds because such is known in the art, as taught by the Admitted Prior Art (see paragraph 4 above).

Regarding claims 44 and 11, selection of particular amounts of each component present in the compounds would have been within purview of the skilled artisan at the time the invention was made.

Regarding claims 12-13, these limitations were addressed above with respect to claim 36.

16. Claims 40 and 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimock and the collective teachings of the Admitted Prior Art and Veerasamy '506 as applied to claims 36 and 1 above, and further in view of Hartig et al.

Regarding claims 40 and 4-5, Kimock is silent as to a solar control coating on the side of the glass opposite the DLC layer. It is known in the art to provide a solar control coating on the interior surface of a glass substrate used in an IG window, as taught by the Admitted Prior Art (p. 1, [003]). It is also known in the art to have that solar control layer comprise dielectric layers and Ag and NiCr layers sandwiched between the dielectric layers, as taught by Hartig (Figures 1-2).

It would have been obvious to the skilled artisan at the time the invention was made to provide a solar control coating on the surface of the glass substrate of Kimock opposite the DLC layer because such is known in the art, as taught by the Admitted Prior Art, wherein the solar control coating improves the performance of the IG window.

17. Claims 46 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimock and the collective teachings of the Admitted Prior Art and Veerasamy as applied to claim 36 and 14 above, and further in view of Veerasamy et al. '480.

Regarding claims 46 and 15-16, Kimock is silent as to the DLC layer's hardness. Selection of a particular hardness would have been within purview of the skilled artisan at the time the invention was made. However, it would have been obvious to use a DLC layer having a hardness consistent with that claimed in the present invention because such is known in the art, as taught by Veerasamy '480 (column 10, lines 9-26).

18. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimock and the collective teachings of the Admitted Prior Art and Veerasamy '506 as applied to claim 1 above, and further in view of Yamasaki et al.

Regarding claim 17, Kimock is silent as to these limitations. Selection of a DLC alyer having particular properties would have been within purview of the skilled artisan. However, it would have been obvious to use a DLC layer having a density of at least 2.7 g/cm3 because such is known in the art, as taught by Veerasamy '506 (p. 9, lines 1-2). It also would have been obvious to use a hydrogenated DLC because such is known in the art, as taught by Yamasaki et al. (p. 3, lines 39-40).

Regarding claim 18, all the limitations were addressed with respect to claim 17 above except the DLC being highly tetrahedral amorphous carbon. Veerasamy '506 teaches this (p. 12, lines 2-3).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Jessica L. Rossi** whose telephone number is **703-305-5419**. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael W. Ball can be reached on 703-308-2058. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jessica L. Rossi
Patent Examiner
Art Unit 1733

jlr

Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700